30 are decoded from the transformed header section 6a, they can be used to decode the transformed data section 6b to recover the binary data. To ensure that the encoding parameters 30 will be accurately reconstructed from the transformed matrix image 6, the set of encoding parameter images 88 is preferably encoded using large region sizes and color sets having fewer color choices.

As another aid to ensure successful detection and decoding of the contents of the transformed header section 6a, regions of white space in the header 4a of the encoded linear matrix image 4 separate the detection key 84, the predetermined tuning pattern 86, and the encoding parameter images 88.

In some embodiments, the header section 4a also includes human-readable instruction text 90. The text 90 allows instructions to be provided to a user who views the encoded 4 or transformed matrix image 6. For example, when viewing the web page 36 linked to the encoded matrix image 4 with a web browser on the host 120, the text 90 could inform the user to print the web page to the printer 130 in order to upgrade his firmware.

Some embodiments of the header section 4a also includes a subset of colored header marking regions 82 that form a peripheral key 92. The peripheral key 92 has a pattern which indicates whether the data encoded in the encoded matrix 4 is appropriate for the peripheral 130. If the peripheral key 92 is not correct for the peripheral 130, the peripheral 130 will ignore the data.

Considering now in greater detail the encoding parameters 30, a preferred set of encoding parameters 30 are indicated in Table I. As described heretofore, the values of the encoding parameters 80 are preferably determined from the image-distortion characteristics 32 of the image data channel 40.

Parameter	Definition
NumChannels	Number of color channels used to specify the color for a region 80 (eg. RGB encoding uses 3 channels, KCMY encoding uses 4 channels)
SafeWidth	The maximum safe image width 94 for an encoded matrix image 4 to avoid clipping in the X direction. Typically in pixels.
SafeHeight	The maximum safe image height 95 for an encoded matrix image 4 to avoid clipping in the Y direction. Typically in pixels.
MinX	The minimum size of a region in the horizontal X direction to ensure detection. Typically in pixels.
MinY	The minimum size of a region in the vertical Y direction to ensure detection. Typically in pixels.
MinColorVal	The minimum color value of a color channel
MaxColorVal	The maximum color value of a color channel
MinColorChg	The minimum change in a color channel required to ensure detection as a different color

Table I

The size of each rectangular color data marking region 80 in the encoded data section 4b is MinX by MinY pixels. The number of discrete colors in the color choice set is determined according to the formula (any remainder is truncated):

Number of colors in set = (MaxColorVal - MinColorVal) / MinColorChg

It should be noted that alternate embodiments of the encoding parameters 30 may include separate Min-Color-Val, Max-Color-Val, and Min-Color-Chg parameters for each of the color channels.

Regions 80 are preferably arranged from left to right in each horizontal row. A new horizontal row positioned below the previous one is started when the maximum number of regions 80 in a row is reached. The maximum number of regions 80 that can be printed in a single horizontal row is determined by the formula (any remainder is truncated):

Number of regions in a row = SafeWidth / MinX

The maximum number of horizontal rows of regions 80 that can be arranged in a block 96 of the data section 4b is determined by the formula (any remainder is truncated):

Number of rows in a block = SafeHeight / MinY

Blocks 96 are separated from each other in the data section 4b by an embedded pagination white space 97 which ensures that clipping in the Y direction will be avoided.

Considering now the encoding of the binary data 2 to form the colored data marking regions 80, and with reference to the exemplary matrix image 4 of FIG. 8, the